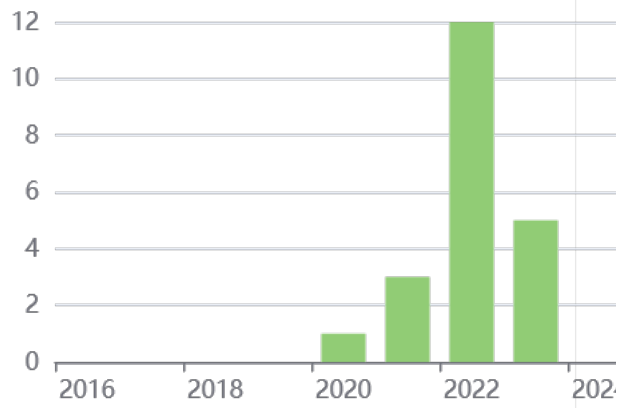
INTERNATIONAL ISLAMIC MEDICAL JOURNAL

UNIVERSITAS NAHDLATUL ULAMA SURABAYA

P-ISSN : 27162370 E-ISSN : 27162389



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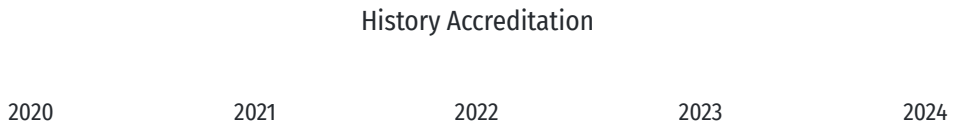

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The International Islamic Medical Journal (IIMJ) is the official journal of Faculty of Medicine, University of Nahdlatul Ulama Surabaya, Indonesia. It serves primarily as a forum for education and intellectual discourse for health professionals namely in clinical medicine but covers diverse issues relating to medical ethics, professionalism as well as medical developments and research in basic medical sciences. It also serves the unique purpose of highlighting issues and research pertaining to the Islamic medical in the world. IIMJ is an online journal published twice a year (June and December). This article should be written in academic English.

PUBLISHED: 2021-07-28

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ISSN

E-ISSN 2716-2389

P-ISSN 2716-2370

International Islamic Medical Journal
Journal Homepage ://journal2.unusa.ac.id/index.php/IIMJ

Clinical Characteristic of Congenital Fetal Anomaly In Tertiary Referral Hospital in East Java, Indonesia

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ARTICLE INFO

Keywords:
Congenital Fetal Anomaly, East Java, Indonesia

Submission:
June 30th, 2020
Review:
November 2nd, 2020
Publish:
July 25th, 2021

ABSTRACT

Background: Congenital fetal anomalies were defined as any structural defect present at birth. Congenital fetal anomalies are an important causes of neonatal morbidity and mortality in developed and developing countries that affect health care system. Reliable data on these congenital anomalies are still lacking, especially in Indonesia. Objective: This study aims to determine the characteristic profile of congenital fetal anomaly in single tertiary hospital in East Java, Indonesia. Methods: Retrospective cross-sectional by using medical record data of dr. Soetomo General Hospital on January – December 2017. Results: There were 58 cases (4,3%) with fetal congenital anomaly from 1360 deliveries in 2017. The majority of cases were referral cases (51 cases; 88%) and only seven cases were booked cases in obstetric outpatient dr. Soetomo General Hospital. Most of these congenital fetal anomaly cases (25 cases / 43,1%) were born from mother with ages 20 – 30 years old. Most cases (34 cases; 58,64%) were diagnosed first at third trimester (gestational age > 28 weeks). There were 36 cases (62%) had active termination of pregnancy. Thirty eight percent (22 cases) were born at 37-42 weeks and majority were born section caesaria. The three highest proportion of organ systems involved in fetal congenital anomalies were those of abdomen (22 cases; 37,9%); head (20 cases; 34,5%); thorax and muskuloskeletal (each 12 cases; 20,7%). Conclusion: The incidence of congenital fetal anomaly in dr. Soetomo Hospital at 2017 was 4,3%. Omphalocele and CTEV were two most common types of congenital fetal anomaly found. Most cases of congenital fetal anomalies have a poor prognosis, 67% cases born died. Further research about risk factors and comprehensive database are needed on cases of congenital anomaly to establish appropriate prevention and management.

Introduction

Congenital anomalies are the majority causes of mortality in developed and developing countries. Congenital anomalies are also known as birth defects, congenital disorder or congenital malformation. It can be defined as a structural or functional anomalies that occure during intrauterine life and can be identified prenatally, at birth or later in life (WHO, 2016). Congenital anomalies contribute to perinatal mortality and long-term morbidity that affect on society and health care system. Globally, an estimated 7,9 million children (6 percent of total births worldwide) are born each year with serious birth defect or congenital anomalies[2]. According to the World Health Statistics 2012, about 7% of all under-five

deaths globally are caused by congenital anomalies (WHO, 2012). Congenital malformations contribute to: 1.4% of deaths in the age group 0–6 days of life; and to 19% of deaths in the age group 7–28 days (Ministry of Health, Republic of Indonesia, 2010). Among infants with malformation who do not survive, more than 70% die in the first month of life. Approximately 40% to 60% are unknown origin. The etiology of congenital malformation is genetic (30-40%) and environmental (5 to 10%). Among the genetic etiology : chromosomal abnormality constitutes 6%, single gene disorders 25% and multifactorial 20- 30% (Rajangnam *et al*., 2007).

Dr. Soetomo General hospital is the only tertiary referral hospital center in eastern Indonesia, and handles many referal cases of congenital anomaly. This study aims to determine determine the pattern and characteristic profile of congenital fetal anomalies in single tertiary referral hospital in East Java, Indonesia.

Methods

This study was a cross-sectional retrospective study using electronic medical data records in dr. Soetomo General Hospital at January 2017 until December 2017. The inclusion criteria of this study were cases with congenital fetal anomaly that have been performed ultrasound examination and born in dr. Soetomo General Hospital. Exclusion criteria were infants which born outside dr. Soetomo General Hospital. The data obtained were collected about clinical information including: maternal profile (maternal age, parity, previous birth history abnormality), gestational age when first diagnosed, gestational age at termination, mode of delivery, amniotic fluid volume and prognosis of fetus. The diagnose of congenital fetal anomaly was made by routine ultrasound during pregnancy follow up and by referred hospital which was then reconfirmed in dr. Soetomo General Hospital. From these data, we traced the type of congenital anomaly was found, infant's outcome and appropriateness of abnormalities obtained during ultrasound with at birth.

Results and Discussion

A total of 58 cases (4,3%) with fetal congenital anomaly of 1360 births at Dr. Soetomo General Hospital were recorded during January 2017 until December 2017. We found 2 cases with conjoint twin. The majority of cases were referral cases (51 cases; 88%) and only seven cases were booked cases in obstetric outpatient dr. Soetomo General Hospital. Maternal profile of congenital fetal anomaly in dr. Soetomo Hospital at 2017 based on maternal age, maternal parity and previous birth history can be seen in Figure 1.

Nineteen cases (32,8%) were born to mother aged over 35 years, fourteen cases (24,1%) born to mother aged 30-35 years, twenty five (43,1%) born to mother aged 20-30 years. Many studies proves that increased maternal age is a risk factor for congenital abnormalities. It was caused by the correlation between advanced maternal age with chromosomal abnormality in fetus. A three-years prospective study from India showed that maternal age has statistically significant association with congenital fetal anomalies (Thaddanee *et al*., 2016). However, this was contrary with our study. It may be due to small number of cases included in this study and only one year study.

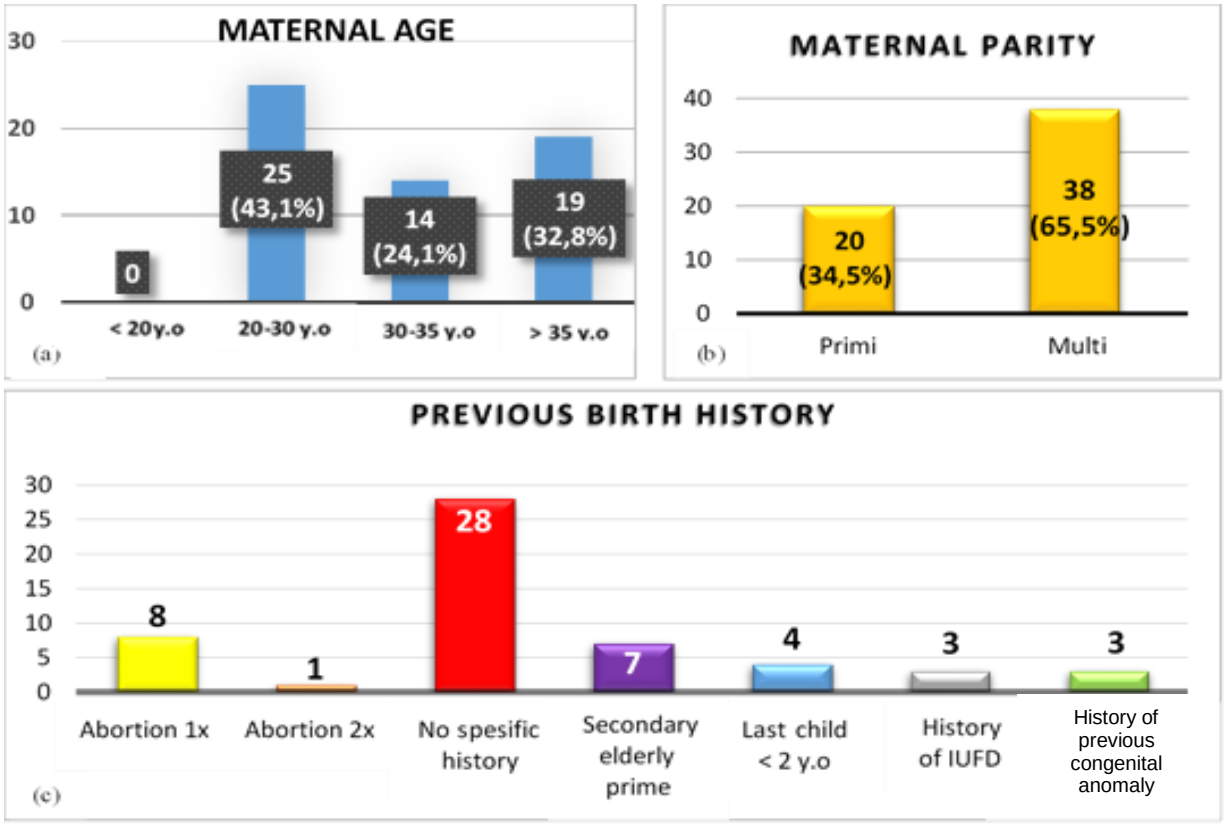

Figure 1. Maternal profile of Congenital Fetal Anomaly in dr. Soetomo Hospital at 2017 based on (a) Maternal Age, (b) Maternal Parity, (c) Previous Birth History

Based on maternal parity, thirty eight cases (65,5%) were multipara and twenty cases (34,5%) were primipara. This is consistent with research conducted in India at 2013 that congenital fetal anomalies were more frequent in multipara compared to primipara (Sarkar, *et al.*, 2013). The other study by Patel also showed that incidence of congenital malformation was higher in multipara (Patel and Chaudary, 2017). Based on multiparous cases in this study, there was several previous birth history abnormality such as abortion (9 cases), the pregnancy distance from last child $\geq$ 10 years or secondary old prime (7 cases), last child less than 2 years old (4 cases), history of intrauterine fetal death (IUFD) in previous pregnancy (3 cases), history of congenital abnormality in previous pregnancy (3 cases). There were twenty eight cases which no specific history in previous birth. The characteristic of pregnancy profile in congenital fetal anomaly's cases at dr. Soetomo Hospital can be seen in table 1 below.

Most of them (34 cases; 58,64%) were diagnosed at gestational age in third trimester (> 28 weeks). Twenty three cases (39,66%) were diagnosed at second trimester (gestational age 15-28 weeks) and only one case was diagnosed at first trimester (gestational age 0-14 weeks). This was happened because many referral cases came to dr. Soetomo Hospital at the second and third trimester. Thirty eight percent (22 cases) were born in aterm (gestational age 37-42 weeks) and the others (36 cases; 62 %) were born in preterm (gestational aget less than 37 weeks) . This study is inconsistent with other researches in India that showed most cases of malformed babies were born aterm (Patel and Chaudary, 2017; Dutta *et al.*, 2010).

Table 1. Characteristic of Pregnancy Profile in Congenital Fetal Anomaly's Cases at dr. Soetomo Hospital

Pregnancy profile		n (%)
Gestational age at first diagnosed	0-14weeks	1 (1,7%)
	15-28 weeks	23 (39,66%)
	>28 weeks	34 (58,64%)
Gestational age at labor	<20 weeks	2 (3,5%)
	20-28 weeks	2 (3,5%)
	28-34 weeks	15 (26%)
	34-37 weeks	17 (29%)
	37-42 weeks	22 (38%)
Prognosis	Dubia ad bonam	1 (2%)
	Dubia ad malam	34 (58%)
	Dubia	23 (40%)

The study in Dr. Wahidin Sudirohusodo Tertiary Hospital, Makassar, Indonesia at 2016 showed that 68% babies with congenital fetal anomaly were born at gestational age ≥ 37 weeks (Lestari and Febriani, 2017). It possibly happened because in this study, there were more cases of congenital fetal anomaly that had poor prognosis (34 cases; 58%) so that active pregnancy terminations were carried out before term. It was only one case of congenital fetal anomaly with prognosis of dubia ad bonam, others (23 cases; 40%) still had uncertain prognosis (dubia).

In this study, we also evaluate the characteristic of pregnancy termination in congenital fetal anomaly's cases based on: active and spontaneous termination, the reason for active termination of pregnancy and mode of delivery. It summarized in figure 3.

Of 58 congenital fetal anomaly's cases, there were 36 cases (62%) had active termination of pregnancy, others (22 cases; 38%) had a spontaneous labor. The reason of active termination of pregnancy can be seen in figure 3 (b). Sixteen cases (44,4%) were terminated due to term gestational age, eight cases (22,2%) due to IUFD (intra uterine fetal death), five cases (13,9%) due to family decision of bad prognosis, others due to severe oligohidramnion, severe preeclampsia and mirror syndrome. Mode of delivery of congenital fetal anomaly's cases can be seen in figure 3 (c). Most cases

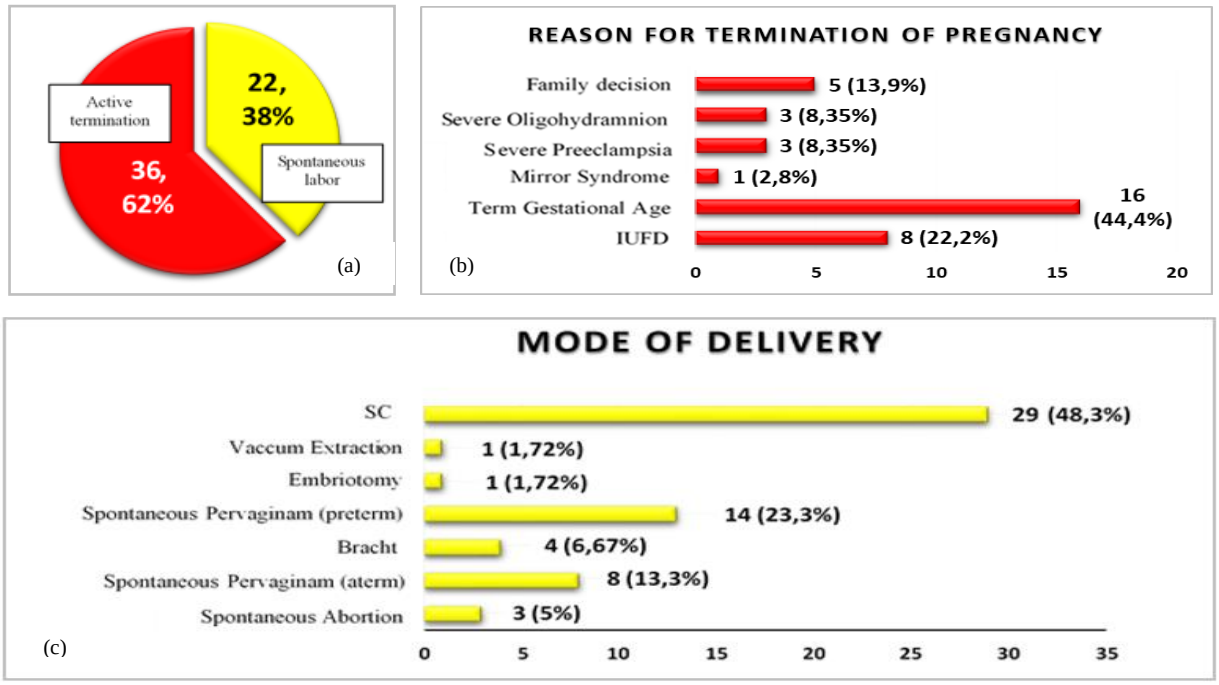

Figure 3. Characteristic of Pregnancy Termination in Congenital Fetal Anomaly's Cases based on: (a) active and spontaneous termination, (b) reason for active termination of pregnancy, (c) mode of delivery

(29 cases; 48,3%) were born sectio caesarian. The study by Wills also shows that most cases of congenital anomalies were born caesarian (59,1%) and mainly done for obstetric indication (Wills, *et al.*, 2017).

Table 2 shows the description about organ systems that involved in 58 cases of congenital fetal anomaly. This study found 19 cases (33%) were born with single type of congenital fetal anomaly and others with multiple anomalies (39 cases; 67%).

Table 2. Description about Type of Congenital Fetal Anomalies according to Organ Systems that Involved in dr. Soetomo General Hospital

Organ Systems (%)	**Type of congenital fetal malformation**		**n**
Head (34,5%)	Facial	Ear Malformation	1
		Cleft Lip Palate	3
		Microcephaly	1
		Dolichocephaly	1
	Central nervous systems	Anencephaly	1
		Dandy Walker Syndrome	2
		Hydrocephalus	3
		Holoprosencephaly	3
		Meningoencephalocele	3
		Meningocele	2
Thorax (20,7%)	Non Cardiovascular	Congenital Hydrothorax	1
		Lung Hypoplasia	2
	Cardiovascular	Truncus Arteriosus	1
		Ectopia Cordis	1
		Dilated Cardiomyopathy	2
		VSD	2
		PDA	1
		Eibstein Anomaly	1
		Multiple Heart Anomalies	1
Musculoskeletal (20,7%)	Extremities	Micromyelia	1
		Syndactyly	1
		Polydactyly	3
		CTEV	7
Abdomen (37,9%)	Gastrointestinal Tract	Diaphragmatic Hernia	1
		Duodenal Atresia	2
		Omphalocele	13
		Congenital Megacolon	1
		Gastroschisis	3
	Urinary Tract	Hydronephrosis	2
Hidrops foetalis (15,5%)			9
Body Stalk Anomaly (3,4%)			2
Conjoint twin (3,4%)			2
Acardiac twin (1,7%)			1

The three highest proportion of organ systems involved in fetal congenital anomalies were those of abdomen (22 cases; 37,9%); head (20 cases; 34,5%); followed by thorax and muskuloskeletal (each 12 cases; 20,7%). The study in India conducted by Patel in 9600 malformed babies showed that the three most common system involved were cardiovascular system (23,4%), musculoskeletal system (23,4%) and gastrointestinal tract (15,9%) (Patel and Chaudary, 2017). The results of surveillance of the Ministry of Health of the Republic of Indonesia with 28 selected

hospitals in 18 provinces from September 2014 to March 2018 showed that 1085 infants with birth defects were reported. It showed that the most common congenital abnormalities were involved 21,9% the musculoskeletal system (talipes equino-varus); 20,4% orofacial cleft; 18,4% the nervous system (neural tube defect); and 16,14% abdominal wall defect (Ministry of Health, Republic Of Indonesia, 2018). The study from Mustofa *et al.,* in four teaching hospital in Indonesia showed the most of congenital anomalies involved gastrointes-tinal tract (25,8%) Mustofa *et al.*, 2009). The data about the most common type of congenital anomalies in Indonesia varies depending on each region. The differences of the most common type of congenital fetal anomalies between studies might be related with different race, ethnic, geographic and social factors.

There were two cases with conjoint twins so the total infant with congenital fetal anomaly were 60. We described about fetal's gender, fetal birth weight, APGAR scoret and we traced the infant's outcome. It can be seen in table 3.

Table 3. Infant's Outcome of Congenital Fetal Anomalies's Cases in dr. Soetomo Hospital at January – December 2017

Infant Outcome		**n (%)**
Infant's Gender	Female	31 (51,7%)
	Male	23 (38,3%)
	Ambiguous	6 (10%)
Fetal Birth Weight (grams)	< 1000	10 (16,7%)
	1000-1500	5 (8,3%)
	1500-2500	25 (41,7%)
	≥2500	20 (33,3%)
APGAR Score	0	13 (22%)
	1-3	29 (48%)
	4-6	11 (18%)
	7-9	7 (12%)
Infant's Outcome	Died	40 (67%)
	Live	20 (33%)

Thirty one infants (50%) were female, 23 infants (37%) were male and 8 infants (13%) can not be differentiated (ambiguous). There were 40 cases (67%) of congenital fetal anomaly died. The limitation of this study is we did not evaluate and follow the infant's growth and development after birth.

We tried to evaluate the congruence between fetal abnormalities found during ultrasound and abnormalities at birth. Fifty five cases (94,8%) of congenital fetal anomaly obtained to be appropiate between ultrasound result and anomaly found at birth. There were two cases with undetected anomalies in ultrasound. One case could not be identified due to the infant born stillbirth and did not perform post mortem autopsy.

Conclusion

The incidence of congenital fetal anomaly in dr. Soetomo Hospital at 2017 was 4,3%. The majority of congenital fetal anomaly's cases had multiple anomalies (39 cases; 67%). Omphalocele and CTEV were two most common types of congenital fetal anomaly found. Most cases of congenital fetal anomalies have a poor prognosis, 67% cases born died. There were 94,8% compatibility between ultrasound results and abnormalities found at birth in cases of congenital fetal anomaly at dr. Soetomo Hospital. Further research is needed to determine the risk factors in cases of congenital fetal anomaly at dr. Soetomo General Hospital.

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